State of California
AIR RESOURCES BOARD

Resolution 01-1

January 25, 2001

Agenda Item No.: 01-01-1

WHEREAS, sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the Board or ARB) to adopt standards, rules and regulations and to do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, in section 43000 of the Health and Safety Code, the Legislature has declared that the emission of air pollutants from motor vehicles is the primary cause of air pollution in many parts of the State, and sections 39002 and 39003 of the Health and Safety Code charge the Board with the responsibility of air pollution control from motor vehicles;

WHEREAS, sections 43013, 43101, and 43104 of the Health and Safety Code authorize the Board to adopt emission standards and test procedures to control air pollution caused by motor vehicles;

WHEREAS, section 43018(a) of the Health and Safety Code directs the Board to endeavor to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of state ambient air quality standards at the earliest practicable date;

WHEREAS, section 43018(c) of the Health and Safety Code provides that in carrying out section 43018, the Board shall adopt standards and regulations that will result in the most cost-effective combination of control measures on all classes of motor vehicles and motor vehicle fuel, including but not limited to reductions in motor vehicle exhaust and evaporative emissions, and reductions in in-use vehicular emissions through durability and performance improvements;

WHEREAS, the California State Implementation Plan (SIP) for ozone, adopted by the Board in November 1994, establishes the state strategy for attaining the ambient air quality standard for ozone in all areas of the state by 2010 as required by federal law; this plan includes, as part of the mobile source element developed by the ARB, the California Low-Emission Vehicle (LEV) program, which was approved by the Board in

1990 to provide significant reductions of ozone precursor pollutant emissions from passenger cars and light-duty trucks;

WHEREAS, the California LEV program includes a zero-emission vehicle (ZEV) element – now contained in section 1962, title 13, California Code of Regulations and the incorporated “California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes” – under which at least 10 percent of the passenger cars and lightest light-duty trucks produced by a large or intermediate-volume manufacturer and delivered for sale in California must be ZEVs, beginning in model year 2003;

WHEREAS, large-volume manufacturers are permitted to satisfy up to 6 percent of the 10 percent ZEV requirement with larger numbers of partial ZEV allowance vehicles (PZEVs) reflecting near-zero emitting technologies, and intermediate volume manufacturers may meet the entire 10 percent obligation via that route; the ZEV regulation also includes a number of credit generation and trading components that provide significant flexibility in meeting the requirements;

WHEREAS, with respect to the environment, ZEVs are the "gold standard" for vehicular air pollution control as they reduce both criteria and toxic pollutant emissions to the maximum feasible extent; high-efficiency ZEVs and hybrid electric near-ZEVs also cut emissions of carbon dioxide and other greenhouse gases;

WHEREAS, in Resolution 90-58 approving adoption of the regulations creating the California LEV program, the Board directed the staff to consult with the regulated industry and other interested parties and to prepare a report regarding the status of the implementation of the LEV program – including the ZEV requirement – for submission to the Board at least every two years;

WHEREAS, in March and May of 2000, ARB staff held public workshops to solicit information regarding the status and issues related to the ZEV program such as vehicle and battery technology, infrastructure, marketability, cost, and environmental benefits as part of the biennial review process;

WHEREAS, the ARB staff evaluated the vehicle technologies and concluded that there are no technological barriers to building battery powered ZEVs but issues of cost and consumer acceptance remain; with regard to near-zero emission vehicles, technology exists which allows vehicles to achieve the required level of performance;

WHEREAS, to obtain the best available information on battery advances, costs and future trends, the ARB contracted with a Battery Panel composed of three outside

experts; the Panel concluded that nickel metal hydride (NiMH) batteries are the most promising advanced technology – having both high performance and the longest useful life – but also that NiMH battery costs are high and that mass production and further technological development is needed to reduce those costs;

WHEREAS, staff's cost analysis concludes that both the initial and lifecycle costs of battery electric vehicles will significantly exceed those of comparable conventional vehicles in the 2003 timeframe; however, with volume production and improved technology, battery electric vehicles could ultimately become competitive on a lifecycle cost basis;

WHEREAS, at its September 7-8, 2000 meeting, the Board in Resolution 00-29 directed the staff to develop and propose regulatory modifications and other steps that address the challenges associated with the successful long-term implementation of the ZEV program – in particular the need for product availability and market stability, the need to greatly enhance public awareness and education of the attributes and benefits of ZEV technologies, and the need to reduce or mitigate the high initial costs of vehicles and batteries in low-volume production – and that result in a sustainable market for ZEVs;

WHEREAS, the staff held a workshop in October 2000 to solicit input from industry and interested stakeholders on strategies and approaches for addressing the Board's September 2000 resolution;

WHEREAS, in conjunction with a public hearing notice dated December 8, 2000, the staff has proposed a comprehensive set of amendments to the zero-emission vehicle regulation and related regulatory definitions; the initially proposed amendments are set forth in Attachment A hereto and include the following primary elements:

The establishment of phase-in multipliers for the introduction of ZEVs and partial ZEV allowance vehicles that would provide a smooth introduction in the early years; ZEVs introduced before the 2006 model year would receive multipliers of 4.0 for the 2001 and 2002 model years and 1.25 for the 2003-2005 model years, and the proposed phase-in level for PZEVs is 25 percent of the current requirement in 2003, 50 percent in 2004, 75 percent in 2005, and 100 percent in 2006;

A reduction in credits earned by neighborhood electric vehicles, which have a top speed of no more than 25 miles per hour; credits for such vehicles would be reduced to 0.5 for the 2004 and 2005 model years and 0.15 for 2006 and subsequent years;

An increase in the amount of PZEV allowance to 0.25 for vehicles with advanced ZEV components; a PZEV power-assist hybrid-electric vehicle would earn an allowance of 0.45, before any phase-in multipliers;

Modification of the ZEV extended range multiplier to reduce the minimum range needed for multiple credits to 50 miles; as range increases from 50 miles to 275 miles, the credit would increase from 1 to 10 in a linear fashion;

The opportunity for hybrid-electric vehicles (HEVs) that have an all electric range of 20 miles or more, and also meet the basic PZEV requirements, to satisfy the 4 percent pure ZEV requirement; the credits earned by such vehicles would be calculated according to their zero emission range and adjusted to reflect the fact that the effective range of such vehicles is greater than that of pure battery electric vehicles due to their hybrid powertrains;

The opportunity for advanced technology PZEVs, and credits from ZEVs or extended range HEVs placed as part of a transportation system, to satisfy up to one half of the 4 percent portion of the pure ZEV requirement; the advanced technologies would include both PZEVs qualifying for an allowance of 0.4 or more and allowances earned by manufacturers placing ZEVs or extended range HEVs within a “transportation system;”

Providing additional credits for ZEVs and extended range HEVs in California service for more than three years with an extended battery/fuel cell stack warranty; these vehicles would receive an additional credit of 0.1 times the original credit value of the vehicle for each year that a vehicle remains in service in California past three years with extended warranty coverage on the battery or fuel cell stack;

Providing a credit multiplier based on vehicle efficiency, phased in beginning in 2005; the efficiency multiplier would be limited to ZEVs and advanced technology PZEVs;

Requiring vehicle placement in order to earn multiple allowances, making the sales volume used to determine manufacturers’ ZEV obligation in a given year a function of vehicle sales in a prior three year period, and freezing the volume number for three years at a time;

Increasing the maximum size cut-off for an intermediate volume manufacturer from 35,000 to 60,000 new light- and medium-duty vehicles per model year; providing that when a manufacturer transitions from intermediate to large volume manufacturer, there would be no “pure” ZEV obligation for the manufacturer until

the sixth model year after three consecutive model years over the large manufacturer threshold; and exempting an independently owned manufacturer with California sales of light- and medium-duty vehicles not exceeding 10,000 per year from the ZEV requirement; and

An increase in the 10 percent ZEV requirement for large and medium-volume manufacturers to 11 percent for the 2009-2011 model years, 12 percent for the 2012-2014 model years, 14 percent for the 2015-2017 model years, and 16 percent for 2018 and subsequent model years; as the ZEV requirement increases starting in the 2009 model year, the portion that could be satisfied by 0.2 allowance PZEVs is held at 6 percent and the pure ZEV portion that can be satisfied by advanced technologies is limited to 50 percent of the total;

WHEREAS, at the January 25, 2001 hearing on the proposal, staff has suggested several modifications to the original proposal; these modifications are set forth in Attachment C hereto and include changing the way the high efficiency multiplier is calculated, making the new ZEV multiplier provisions applicable to 2000 model year vehicles, and correcting the ZEV multiplier calculation;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project which may have significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available to reduce or eliminate such impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, the Board has considered the effect of the proposed amendments on the economy of the State;

WHEREAS, the Board finds that:

Although significant strides have been made toward improving California's air quality, health-based state and federal air quality standards continue to be exceeded in regions throughout California; the federal 1-hour ozone standard is exceeded in the South Coast Air Basin, San Diego County, the San Joaquin Valley, the Southeast Desert, the greater Sacramento area and Ventura County, and more areas of the State are likely to be designated as being in nonattainment of the new federal eight-hour ozone standard;

Ozone in the lower atmosphere is created by the photochemical reaction of ROG and NOx, and leads to harmful respiratory effects including lung damage, chest pain, coughing, and shortness of breath, especially affecting children and persons with compromised respiratory systems;

ZEVs represent the cleanest, most advanced technologies available; the commercialization of ZEVs through regulatory requirements and other incentives is critical to the long-term success of California's clean air program;

The amendments approved herein to the rate and timing required for the introduction of ZEVs and PZEVs are needed to better reflect the availability of PZEVs and the emerging market for ZEVs and to take advantage of the air quality benefits afforded by the technologies;

The amendments approved herein to the ZEV and PZEV incentive structure provide increased flexibility for manufacturers to pursue specific strategies that in their view offer long term promise;

The phased reduction in available credits for neighborhood electric vehicles is necessary and appropriate because their overall functionality is much less than is the case for full function ZEVs;

The amendments approved herein increasing the percentage ZEV requirements for the 2009 and subsequent model years are necessary and appropriate to further expand the ZEV fleet with its attendant emissions benefits;

Overall, the amendments approved herein represent the most effective path towards maintaining progress towards commercialization of ZEVs while recognizing the near term constraints due to cost, lead time, and technical challenges; and

The LEV and ZEV program biennial review mechanism has recently resulted in needless uncertainty and delay as interested parties have awaited completion of the review process.

WHEREAS, the Board further finds that:

The amendments approved herein are expected to result in a 2010 net increase of about 0.14 tons per day of direct emissions of ROG and NOx combined in the South Coast Air Basin, with this increase almost entirely due to changes in the PZEV phase in provisions; indirect 2010 emissions would increase by about 0.05 tons per day of ROG + NOx; and 2020 direct emissions of ROG + NOx are

expected to decrease by about 0.08 tons per day in the South Coast Air Basin; overall, this will not constitute a significant adverse environmental impact; and

The amendments approved herein will not have any significant adverse impacts on the environment in areas other than air quality.

WHEREAS, the Board further finds that:

The expected savings resulting from the proposed amendments in model year 2003 range from about $130 million (if vehicle manufacturers were to meet their collective ZEV obligations with 100 percent NEVs under both the current and amended regulation) to more than $400 million (if vehicle manufacturers were to meet their collective ZEV obligations with 100 percent full function EVs under both scenarios); the savings in model year 2004 would be less than in 2003, due to the increased volume of PZEV production required as the PZEV phase-in multiplier is reduced; and

While the amendments approved herein will significantly improve the cost-effectiveness of the ZEV requirements, they will still result in higher costs per ton of pollution reduced than any other ARB regulatory measure; nevertheless, the amended ZEV regulations remain an essential component of the State's long-term air quality strategy because of the promise and ultimate necessity of zero-emission technologies.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves the amendments to title 13, California Code of Regulations, sections 1900, 1960.1(k), 1961 and 1962, set forth in Attachment A hereto, and approves the amendments to the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes" as set forth in Attachment B hereto, with the modifications to both that are set forth in Attachment C hereto, and with the following additional modifications, consistent with reflecting the "red line" full-function electric vehicle plus City EV introduction scenario shown as "2x staff proposal phase-in in '07" in Attachment D hereto:

Compared to the modified staff proposal and accounting for increased numbers of ZEVs resulting from the other modifications listed below, approximately double the number of ZEVs required by the 2012 model year, with the ramp up beginning in the 2007 model year;

Add light-duty trucks with a loaded vehicle weight of 3751 pounds or more (the "LDT2" class, which includes most sport utility vehicles) to the current passenger

car and LDT1 classes that form the baseline of vehicles against which the ZEV percentage requirements are applied, phasing in this additional element during the 2007 through 2012 model years;

For the large volume manufacturer requirements, do not allow extended range HEVs to be counted towards meeting the core 20 percent of the manufacturer's percentage ZEV requirement that can otherwise only be satisfied by ZEVs or credits from ZEVs; however, along with allowing extended range HEVs to be counted towards the next 20 percent of the manufacturer's percentage ZEV requirement, allow an appropriate level of enhanced credit, to be identified in the modified regulatory language by the Executive Officer, in order to incentivize these vehicles;

Eliminate the modification proposed by staff that allowed 2000 model-year vehicles to receive ZEV phase-in multipliers; and

Revise the credit relationship between fuel cell vehicles and battery electric vehicles in the later implementation years, to address the current disparity under which a manufacturer could comply with far fewer fuel cell vehicles than would be the case with battery electric vehicles.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to incorporate into the approved amendments the modifications described above, with such other conforming modifications as may be appropriate, and then to adopt the modified amendments, after making the modified regulatory language available for public comment for a period of 15 days, provided that the Executive Officer shall consider such written comments regarding the modified text as may be submitted during this period, shall make modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that, notwithstanding the positive efforts made to date by ZEV advocacy groups and others to educate the public about ZEVs, additional public education will be a necessary part of the successful implementation of the ZEV program; the Board directs staff to continue to work with all ZEV stakeholders in developing and implementing an outreach and public education plan for ZEVs, building on the work already done.

BE IT FURTHER RESOLVED that the Board directs staff to initiate, and take the necessary steps for, the formation of a statewide working group to assess the need for additional incentive or subsidy programs to reduce or mitigate the high initial costs of vehicles and batteries in low-volume production, and to identify and prioritize

appropriate mechanisms for providing such programs, if needed; staff is directed to provide coordination and administrative support for the efforts of the statewide working group, and to additionally explore ways in which purchases or leases of ZEVs by state and local government fleet operators can be substantially expanded.

BE IT FURTHER RESOLVED that the Board directs staff to initiate the formation of a statewide working group to address a variety of infrastructure issues including the development of programs that support, maintain and expand public infrastructure for electric vehicles, and the assessment of additional incentives to offset the costs of infrastructure installation, with a particular focus on incentives for workplace infrastructure.

BE IT FURTHER RESOLVED that the Board shall work to establish an implementation partnership focusing on incentives for station cars and encouraging sustainable transportation systems.

BE IT FURTHER RESOLVED that the Board directs staff to begin the regulatory process for the standardization of charging technologies, including soliciting input from stakeholders, holding a public workshop, and bringing a regulatory proposal for the Board's consideration later this year.

BE IT FURTHER RESOLVED that the staff shall no longer routinely report to the Board at least every two years regarding the status of the implementation of the LEV and ZEV programs; however, staff shall continue to monitor implementation progress and report to the Board when appropriate.

BE IT FURTHER RESOLVED that the Executive Officer is directed to expand and institutionalize an environmental justice program in which lower income communities of color are actively solicited to participate in the Board's rulemaking programs.

BE IT FURTHER RESOLVED that the Executive Officer shall immediately work with representatives of the four states that have adopted the California ZEV requirements pursuant to section 177 of the Clean Air Act, and with other stakeholders including motor vehicle manufacturers, to assure that the ZEV requirements are implemented in those states in a workable way that recognizes the particular challenges faced by manufacturers introducing ZEVs in the Northeast during the initial years of the program, and that contributes to a successful long term ZEV program.

BE IT FURTHER RESOLVED that the Executive Officer shall investigate whether the definition of zero-emission vehicle should be expanded to include electric motorcycles and the degree to which credits generated by such vehicles should be available for use in complying with the percentage ZEV requirements, and shall report back to the Board

on this matter this summer.

BE IT FURTHER RESOLVED that the Executive Officer shall investigate appropriate mechanisms under which credits from heavy-duty ZEVs having a gross vehicle weight exceeding 14,000 pounds could be generated for use in complying with the percentage ZEV requirements, and shall propose regulatory amendments to implement such mechanisms as appropriate.

BE IT FURTHER RESOLVED that the Board hereby determines that the regulations approved herein will not cause California motor vehicle emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards.

BE IT FURTHER RESOLVED that the Board hereby finds that separate California emission standards and test procedures are necessary to meet compelling and extraordinary conditions.

BE IT FURTHER RESOLVED that the Board finds that the California emission standards and test procedures as approved herein will not cause the California requirements to be inconsistent with section 202(a) of the Clean Air Act and raise no new issues affecting previous waiver determinations of the Administrator of the Environmental Protection Agency pursuant to section 209(b) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Executive Officer shall, upon adoption, forward the amended regulations to the U.S. Environmental Protection Agency with a request either for a waiver of federal preemption pursuant to section 209(b) of the Clean Air Act, or a confirmation that the amendments are within the scope of previous waivers.

I hereby certify that the above is a true and correct copy of Resolution 01-1, as adopted by the Air Resources Board.

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Marie Kavan, Clerk of the Board

Resolution 01-1

January 25, 2001

Identification of Attachments to the Resolution

Attachment A: Proposed Regulation Order, as set forth in Appendix A-1 of the Staff Report: Initial Statement of Reasons

Attachment B: Proposed Amendments to the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," as set forth in Appendix A-2 of the Staff Report: Initial Statement of Reasons

Attachment C: "Staff's Suggested Modifications to the Original Proposal," as presented at the January 25, 2001 hearing

Attachment D: "FFEV + City Scenarios" graph presented by staff at the January 25, 2001 hearing, showing five alternative implementation scenarios: Current with FFEV + City; Staff proposal FFEV + City; "SUV" phase-in in '09; 2x staff proposal phase-in in '09; and 2x staff proposal phase-in in '07